

**CLAIMS**

What is claimed is:

1. A watercraft comprising:
  - a.) a generation means comprising at least one electric generator that converts human kinetic energy to electrical energy,
  - b.) a propulsion means comprising of at least one electric motor and at least one apparatus for converting the motor torque to propelling thrust,
  - c.) an energy storage means configured to receive and store electrical energy, and further configured to supply electrical energy to the said electric motor,
  - d.) a first control means to control the loading characteristics of the said generator, and
  - e.) a second control means to control the electrical power supplied to the said electric motor as a function of a load point of the said generator.
2. The watercraft of claim1 wherein the said first control means is arranged to control the loading characteristics of the said generator according to an operator-adjustable function of a load point parameter of the generator.
3. The watercraft of claim1 wherein the said first control means is arranged to control the loading characteristics of the said generator according to an operator-adjustable function of a load point parameter of the generator and time.
4. The watercraft of claim1 wherein the first control means is arranged to control the generator torque according to an operator-adjustable function of the generator speed.
5. The watercraft of claim1 wherein the first control means is arranged to control the generator current according to an operator-adjustable function of the generator voltage.

6. The watercraft of claim1 wherein the said second control means is arranged to control the electrical power supplied to the said electric motor as a function of a load point of the said generator and an operator adjustment.
7. The watercraft of claim1 wherein the said second control means is arranged to control the electrical power supplied to the said electric motor as a function of the speed of the said generator and an operator-adjustable gain factor.
8. The watercraft of claim1 wherein the second control means comprises an electronic circuit configured to receive a signal representative of the desired electric motor operating point, and the electronic circuit configured to control the electric power supplied to the electric motor as a function of the received signal.
9. The watercraft of claim1 wherein the energy storage means and the second control means are arranged to supply the said electric motor substantially more electrical power than that produced by the said generator, thereby enabling the propelling of the watercraft at a speed substantially higher than that achievable via the power supplied by the said generator alone.
10. The watercraft of claim1 wherein the energy storage means is comprised of rechargeable batteries.
11. The watercraft of claim1 wherein the energy storage means is comprised of a flywheel energy storage system.
12. The watercraft of claim1, further including a photovoltaic solar panel.
13. The watercraft of claim1 wherein the said generator produces AC power, and the said first control means comprises an electronic circuit configured to rectify the AC power produced by the said generator to a DC power at a voltage compatible with the said energy storage means, and the electronic circuit further configured to receive a signal representative of a desired amount of power flow from the generator to the said energy storage means, and the electronic circuit further configured to control the power flow from the generator to the said energy storage means.
14. A watercraft comprising:

- a.) an energy storage means for storing electrical energy,
  - b.) a human-powered generator converting mechanical power to AC electric power,
  - c.) a first electronic circuit configured to rectify the AC power produced by the said generator to a DC power at a voltage compatible with the said energy storage means, the first electronic circuit further configured to supply an operating point signal representative of the said generator load operating point, and the first electronic circuit further configured to control the power flow from the generator to the said energy storage means according to a received generator command signal,
  - d.) a propulsion unit comprising of at least one electric motor and propeller,
  - e.) a second electronic circuit configured to control power flow from the said energy storage means to the said electric motor according to a received motor command signal,
  - f.) a third electronic circuit configured to receive the operating point signal supplied by the first electronic circuit, the third electronic circuit further configured to supply the generator command signal to the first electronic circuit according to the received operating point signal and a generator load characteristics function selected by a watercraft operator, and the third electronic circuit further configured to supply the motor command signal to the second electronic circuit according to the received operating point signal and a gain factor selected by the watercraft operator.
15. The watercraft of claim 14 wherein the operating point signal representative of the said generator load operating point is a signal representative of the speed of the said generator.
  16. The watercraft of claim 14 wherein the received generator command signal is a signal representative of the desired generator torque.
  17. The watercraft of claim 14 wherein the generator load characteristics function of the third electronic circuit is configured as a gain factor.
  18. The watercraft of claim 14 wherein the generator load characteristics function of the third electronic circuit is configured as a function of time.

19. The watercraft of claim 14, further including a photovoltaic solar panel configured to supply power to the said energy storage means.

20. A method of powering and controlling a watercraft, comprising:

- a.) providing at least one electric generator that converts human kinetic energy to electrical energy,
- b.) providing at least one electric motor and at least one apparatus for converting the motor torque to propelling thrust,
- c.) providing an energy storage means and configuring it to receive and store electrical energy, and further configuring it to supply electrical energy to the said electric motor,
- d.) providing a means of controlling the loading characteristics of the said generator according to an operator adjustment, and
- e.) providing a means of controlling the electrical power supplied to the said electric motor as a function of a load point of the said generator.